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COUNTRY: Turkey

SUBJECT: Farm Machinery Requirements of Turkish Agriculture.

25X1A6a

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1. The people

- a. Their mode of living
- b. Their customs
- c. Their background in the use of machinery

2. Geography and topography

3. Rainfall and climate

4. Soils

5. Crops

6. Size of farms

7. Transportation

8. Fuels

9. Suitability of our US equipment

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In thinking of the farm machinery requirements of any country, we must first consider the following factors:

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The People

Why should the people of a country be listed as the first consideration in farm machinery requirements? The first and obvious answer is; the people buy the machinery.

The country of Turkey has no factories to manufacture power equipment. There are a few government operated factories that make wagons, walking plows and harrows. They have within the past six months started making arrangements to manufacture some horsedrawn grain drills. Many small private shops make hand tools and threshing sleds. Therefore, they buy power machinery from other countries, generally, wherever they can get it, regardless of quality. Of course, if they can get machinery of good quality they are happy. If they cannot get quality machinery, they must take what is available. They like American machinery and prefer it, especially tractors over other sources.

Mode of Living: In most of the Near East Countries, the people live in closely consolidated villages. They go from the village each day to work the land. In some cases the distance may not be far, but in others the distance may be several miles. The peasant farmer rarely has any buildings on his farm land, consequently, if he uses a tractor, it is driven to and from the village each day. Tractor equipment such as plows, harrows and drills are drawn back and forth from the village to the farm. This practice results in much wear and breakage. In many cases where the Turkish farmer has a crop that can be easily harvested in the night, he builds a small sleeping scaffold and camps with his crop until it is harvested. If for some reason he cannot bring his tractor and equipment back to the village at night, he will camp with it. Should your car break down while traveling, someone stays with it until repairs are made. This may mean several days or a week.

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Customs: Where people have lived for generations and even centuries without many outside contacts and influences, traditions and customs become rather binding. Should someone suggest a change in methods he will very likely be told, "It is not the custom to do it that way". For example, all cotton planters used with tractors in Turkey are mostly of the horsedrawn corn-drill type. They are trailed behind the tractor in mostly two-row units. In a few cases two units have been connected to make a four-row unit. I asked if any farmer had tried a tractor-mounted type. I was told 25X1X6 that one farmer in the area had tried one with poor results, and further more, it was not the custom to plant cotton with such equipment. A very short usage of a method may establish a custom. In another case, I stopped where a group of village people were using sleds and hand tools for threshing and winnowing their wheat. I ask if they would like to have a small thresher so they could thresh their grain in two or three days instead of the weeks it took them to do the job. The answer was, "What would I do then?" I didn't have an answer to that one, so I assumed he was satisfied with his sled. As a whole, however, a Turkish farmer is eager to own a tractor. The ownership of a tractor elevates his standing among his fellow villagers.

When using animal-drawn equipment, it is the Turkish custom to have someone either lead or drive the animals so plowman or operator can give all his attention to guiding the tool. All animal-drawn tools need gauge wheels or tongue trucks to regulate the depth, support and balance the tool. Adjusting the line of draft is little understood.

Background in the Use of Machinery: From the operational standpoint it is a long jump from behind the wooden plow to the tractor seat. Such an individual does not even know how to steer the tractor. He is lost when you start talking about maintenance. His education and training must start with the minutest details of operation. This means from the ignition switch, steering and gear shifting. Then, when you start talking about air cleaners, oil filters, valve and clearance of the distributor and spark-plug points and other maintenance features, it is hard for the former follower of the wooden plow to understand. Tell him to change the oil in the tractor crankcase after many hours or days of operation. He may or may not change it, even though, you explain about oil becoming dirty in the crankcase. He wonders how it can get dirty when it is all closed up. When telling him to drain the oil from the engine crankcase, you must also tell him not to put any of this drained out oil back into it at anytime.

When tractor equipment is considered, the training must start from the simplest adjustments. The wooden plowman knows nothing about the vertical and horizontal lines of pull. After he has been taught to shift gears and steer the tractor, he can hitch on to the plow, but the kind of plowing job done would not likely win in an American plowing contest.

Therefore, from the above it can be seen that the people of a country must be considered in application of American machinery. Mr. Bernar Nahum, Manager of Koc Ticaret of Ankara gives the Turks viewpoint as follows:

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"To see in so big and undreamed quantities American agricultural machinery in my country gives me a new sense of economical security for the following reasons:"

- (1) "Better and larger crops due to the fact that they will permit plowing, tilling, seeding and harvesting in due time larger acreage."
- (2) "Possibility of export of our crop which will balance or even put our country in the black in our international trade balance."
- (3) "Education of our farmers to modern agricultural methods, which will bring them to jump from a very primitive type of farming to an up-to-date one."
- (4) "A sense of responsibility that we have to play our part in the international recovery by exporting our food products to relieve the burden of other less agriculturally blessed countries of Europe and the Near East."
- (5) "The desire to see machinery kept in ship shape working condition, well maintained, serviced, greased, oiled so that the maximum and lengthy rentability can be obtained from them."
- (6) "The conviction that thanks to this machinery the standard of living of our farmers will rapidly grow from a 10th century state to a 19th century American farmers standard. To be more optimist would be, in my mind, foolishness."

Topography

The topography of Turkey is largely mountainous. Only 20 per cent is considered suitable for crop production. A large part of this must be alternately cropped and fallowed. The agricultural lands consists of coastal deltas, mountain valleys and sub-humid plains in Central Turkey and on the Syrian border. Along the Eastern Black Sea Coast, mountains slopes of 45° and greater are intensively cultivated. They told us that field workers in this area needed ropes for safety. One end would be tied to a rock or tree up the slope and the other about the worker's waist. Modern tractors would hardly be suitable for such fields. The broad mountain valleys, the delta areas and the plains are suitable for tractor operation.

Rainfall and Climate

Mountain ranges paralleling the shore lines of the Mediterranean, Aegean, Marmara and Black Seas limits the annual rainfall of Central, Eastern, and Southwest Turkey. The Anatolian Plateau, the "breadbasket" of Turkey has an annual rainfall of 18 to 20 inches. The rainfall for seacoast points ranges from 30 to 50 inches. Riza on the Black Sea in Northeastern Turkey has a rainfall of 100 inches. Most of the timber in Turkey is found in the seacoast mountain ranges. Central, Eastern and Southwestern Turkey has little or no timber.

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Maximum temperatures ranges from 90°F. at Kars, high in the mountains of the East to 114 at Urfa on the Syrian border. Temperatures in the Anatolian Plateau sometimes goes as high as 100 degrees. Ankara has an average temperature of about 55°F. The average July temperature for Ankara is 73°F. At Izmir on the Aegean Sea, the average January temperature is 46°F. while for July it is about 80°F. In Central Turkey the summer days maybe quite warm, but the nights are cool enough for a heavy blanket.

The length of the frost free days ranges from 85 at Kars in the mountains of the East to 287 at Antalya on the Mediterranean Sea Coast.

Soils

In general, the soils of Turkey vary from a light clay loam to a heavy clay loam. One report on the soils of Turkey states, "Strange to say there is little or no sandy soil in Turkey". These clay soils have been tilled for centuries with very little crop residue returned for humus. Most residue, such as wheat straw, is used for fuel. The soil is soft and sticky when wet but hard and lumpy when dry.

Crops

The principal field crops grown are cereals, cotton, tobacco, corn, sugar beets, potatoes and some oil seed crops. Fruits and nuts consists of figs, grapes, hazel nuts and pistachios.

Size of Farms

Turkey has a land area comparable with Texas and Oklahoma. About 80 per cent of the 21 million population is classed as farmers. It is estimated that Turkey has 2 1/2 million farms averaging in size around six acres. Many land owners have several small plots of ground scattered about the village. The small size farms create an additional problem for power farming. The larger size farms are located in South Turkey in the cotton growing areas.

Transportation

There are a few main hard surfaced (crushed rock) roads in the country. Only a small number of the 40 thousand villages have access to these roads. In the winter local roads to most villages are impossible for cars and trucks. Most farmers of Western Turkey have wagons, but there are almost none in the Eastern sections. Donkeys, camels and the human back are the principal means of moving farm produce. Many areas can produce abundantly but poor transportation facilities make outside marketing practically impossible.

Some sugar beets and wheat are shipped by rail. Ships serve the coastal areas but dock facilities are rarely available. Most produce is loaded onto and off the ships from row boats or scows. There is no refrigeration for trucks, railway cars or ships. A refrigerator for US officials is supplied for the possible interest of your and 25X1A29 not warrant dissemination by [redacted]

Fuels

Most of the liquid fuels, gasoline and diesel oil for the Near East Countries are supplied from the Asiatic oil fields and refineries. The

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crude oil contains some sulphur and so does the refined products. Consequently, there is rapid deterioration of various parts of internal combustion engines. It makes necessary frequent over-hauls of diesel injector systems.

I visited one state farm where there were two comparatively new European made tractors equipped with Diesel engines. The tractors were useless because the injector systems had failed.

Suitability of American Equipment

Under this heading I will venture to ask one question. When an American factory receives an order from a foreign country, does the sales division consider all of the factors discussed above?

In partial answer to this question, I will quote from an article in the December issue of The Cotton Gin and Oil Mill Press by M. Neumunz who recently visited Western Turkey. He stated, "Here the Marshall Plan has been of great assistance, and I was amazed at the large number of tractors and agricultural implements to be seen in the fields. German manufacturers and equipment were always liked in Turkey, and they are rapidly gaining their former lead and supremacy". The reason, he said, was explained by one of his English friends as follows:

"Supposing your machine has a round handle. The average Turkish buyer will look it over carefully and then, for argument's sake, and also to get a better buy, may suggest that a square handle would be better and more to his liking. The German salesman will at once agree to this suggestion, and accept the order for the particular equipment with a square handle. His English competitor will shake or scratch his head and point out that they might furnish the square handle, but delivery would be perhaps one year."

"If such a suggestion were made to an American salesman as representative, the answer would be, 'Take our standard machine which happens to be fitted with a round handle or go to H---.'"

Another point is worthy of mention along this line. It was noticed that all decals and instructional tags on American made equipment were in English print. Now, so far as the Turkish buyer is concerned, the factory could just as well save themselves this cost. There are some nice illustrations in the instruction manuals sent with the equipment, but the English printed matter is worthless. Several of the importing agencies were having some of the tractor manuals translated and printed in the Turkish language, I'm sure at their own expense.

Mr. Neumunz could well have added that the attitude of some American farm equipment companies selling machinery in Turkey is simply to sell. They assume the attitude, "Here's the equipment, it's yours to use if you can find out how to operate it".

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Farm Machinery Requirements of Turkey

In general the power and machinery requirements of Turkish agriculture can be divided into three phases, namely: seedbed preparation, seeding and harvesting.

Seedbed Preparations: The first step in seedbed preparation, of course, is the breaking or plowing of the soil. From the days of Noah, the Turkish farmer has used the wooden plow, and there are hundreds of thousands still in use. The "foot" with a metal nose is set almost flat. It, therefore, lifts and stirs the soil without turning a furrow slice. The soil is left more or less lumpy and cloddy.

Most American and European agriculturists regard the wooden plow as a tool that should be regulated to the museum. But, as it only stirs the soil, it embodies the fundamental principles of the chisel plow advocated as one of the most advanced methods of culture in American agriculture.

I suggested that the Turkish government introduce some chisel plows, but the officials said they had not been tried under their conditions. How will they ever know unless they test them? They, however, regard the field cultivator as an excellent tool. They feel that to make progress with tractor power they need moldboard and disk plows.

I observed that all moldboard plows shipped by American factories, both from the United States and Canada, were equipped with general purpose or stubble type bottoms. I saw a number of these in use and I cannot recall seeing a single one that was scouring. At one state farm where they were using about 30 three bottom moldboard tractor plows, the soil had built up to 2 1/2 inches on the surface. The plows were doing nothing but pushing the soil aside and leaving it in big lumps.

Plow designers use to call the Texas blackland soils a "pusher" type. The designers tried many materials and shapes of bottoms and finally came up with what is known as the Texas Blackland Bottom. After explaining to the Turks the similarity of the Turkish and Texas soils, I got them to order a few of the blackland bottoms. To date, I have not obtained a report on their performance.

More than 3,000 one-way plows have been shipped to Turkey, but the Turkish farmer complains that they do not break the soil as deep as he wishes. He has difficulty in adjusting it to obtain good performance. If he has a chance to choose, he will take the standard moldboard or disk plow.

American designed disk plows are well liked in Turkey. The Turkish farmer, however, knows nothing of setting either the vertical or horizontal angles of the disks to suit the soil conditions. He uses it as he gets it. The scrapers are a puzzle and are more often reversed and sticking up in the air rather than set against the disk. If the scraper is not properly set, the soil will collect on the disk, build up between the disk and the scraper.

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Correct hitching to make the plow cut its full width and adjustments for uniform depth of all bottoms are the Turkish farmers main plow problems. He doesn't understand about sealed, greased-packing bearings. You tell him to grease all bearings but the sealed bearing has no fitting, so if he can, he may bore a hole and put in a fitting.

The Turkish farmer can fully appreciate the use of the disk harrow for seedbed preparation, but he has not learned the benefits to be obtained from the rod weeder for weed control on fallow lands.

Seeding: As a whole, few Turkish farmers have grain drills. They do not like the direct connected tractor grain drill as well as they do a drill that is equipped with a tongue truck and an auxiliary steering device. Recent experiments have shown that granular fertilizers will give higher yields, so now, most farmers prefer drills with fertilizer attachments. It is estimated that by good seedbed preparation and seeding with a grain drill, the yields of wheat can be increased by 25 per cent.

If permitted, many Turkish farmers will buy a tractor and no tools to use with it. Therefore, it was necessary to make it mandatory that when he buys a tractor he also must buy, at least, a plow, harrow and drill.

In planting row crops the Turkish farmer believes that close row spacing will give the highest yields. Consequently, in planting cotton and corn, he will generally space his rows 20 to 24 inches apart. If he uses a two-row planter, he will plant and then double back and plant in between the first planted rows. As he uses a trailing type planter, the rows are curved near the ends because he does not want to give up enough land to permit normal turning.

Harvesting: It is estimated that better than 95 per cent of the cereals grown in Turkey are harvested with the hand scythe and threshed by means of a stone studded sled. There are comparatively few stationary grain threshers in use. No threshing machine is acceptable unless it is equipped with a straw cutter or bruiser. The Turkish farmer uses all his grain straw for livestock feed and he firmly believes his stock will not eat the straw unless it is chopped up. The finer the better. The straw bruisers on the threshing machine does not chop the straw as fine as the sled grinds it.

Some small two-wheel portable threshers equipped with an auxiliary engine were introduced. The Turks complained they did not get the capacity claimed. This could be attributed, to some extent, to irregular feeding and to the possibility that straw bruisers were ordered as extras without specifying the higher horsepower engine. It is felt that a small thresher equipped with engine would be suitable for villages as it can easily be moved from one village to another where no tractor power may be available.

The Turkish cereal farmer prefers the self-propelled combine over the pull type combine. This has been somewhat influenced by the fact that all state farms use self-propelled machines. On the other hand, the maneuverability of the self-propelled machine is more suitable

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to the rough and irregularly shaped fields. The farmer will rake and collect the straw behind the combine and chop it up with his sled.

Hammer mills were recommended for this purpose, but only a few have been introduced.

Cultivation of Row Crops

The narrow spacing of the rows does not permit the use of tractor-mounted cultivators. I saw more tractor cultivators stored than in use. I saw one large cotton farmer who had placed a long bar across the drawbar and then hitched five horsedrawn, one-row garden type cultivators to the bar. Five men were guiding these cultivators. The large rubber tired tractor was being driven at a slow walking speed. There was a water boy and a foreman for the crew. So this was an eight-man crew for one tractor cultivator.

Tractors

When rubber tired wheel tractors were first introduced into Turkey, the farmers were prejudiced against them. They did not think they would have as much traction as steel wheels with lugs. Later when rubber tired trailers were introduced, he found he could use his tractor to pull the trailer to haul his produce and family to the larger villages on market days.

In certain areas where the soil is heavy clay, the crawler type tractor is best suited. For Central Turkey and most of the Anatolian Plateau, the wheel tractor is suitable.

Before the beginning of the Marshall Plan in Turkey, there were less than 1,000 tractors in the whole country and these were mostly of European make. Approximately, 7,000 American made (U.S. and Canada) tractors have been put in Turkey by the Marshall Plan. During the past few months, several thousand tractors have been purchased from European sources. Therefore, it is estimated that by June, 1952, there will be approximately 20,000 tractors in Turkey.

Even with this number of tractors, probably 95 per cent of the 2 1/2 million farm families will not receive benefits from them, largely because of their small land holdings.

A. G. Levenson, Farm Machinery Specialist in Turkey, estimates that within a short time the annual bill for parts, replacements and fuel will run around 32 million American dollars.

The puzzle is, where is the money coming from for the foreign exchange. Can they keep on buying new units and at the same time enough parts, fuel oil and tires to keep what they already have in running order?


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